UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/828,116	04/06/2001	Zhongnong Jiang	TI-32309	6799

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ART UNIT	PAPER NUMBER
2644	

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Please find below and/or attached an Office communication concerning this application or proceeding.

	Application No.	Applicant(s)
Office Action Summary	09/828,116	JIANG ET AL.
	Examiner	Art Unit	
	Laura A Grier	2644	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>05 November 2004</u>.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) <u>3,4,6-22 and 25-33</u> is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) <u>16 and 17</u> is/are allowed.

6)☒ Claim(s) <u>3,4,6,7,10,15,25-28 and 31</u> is/are rejected.

7)☒ Claim(s) <u>8,9,12-14,18-22,29,30,32 and 33</u> is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
    Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____.

5)☐ Notice of Informal Patent Application (PTO-152)

6)☐ Other: _____.

DETAILED ACTION

1.   The indicated allowability of claims 4,7, 10, 28 and 31 is withdrawn in view of the newly

discovered reference(s) to Hausman et al. Rejections based on the newly cited reference(s)

follow.

Claim Rejections - 35 USC § 103

2.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in
> section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are
> such that the subject matter as a whole would have been obvious at the time the invention was made to a person
> having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the
> manner in which the invention was made.

3.   **Claim 3-4, 6-7, 10, 25, 26-28 and 31** are rejected under 35 U.S.C. 103(a) as being

unpatentable over Wilson in view of Hausman et al., U. S. Patent No. 5626974 and Lee.

Regarding **claims 3 and 25**, Wilson discloses a method and system for compressing the

dynamic range of audio signals (figures 3 and 5). Wilson's disclosure comprises a receiver

receiving an audio input, wherein the audio input undergoes compression for the purposes of

controlling level of the signal from clipping a signal when the signal exceeds a particular level,

specifically in figure 3, a circuit is provided where an input is received, compression laws are

applied to calculate a gain value (inherent as a compression ratio) in respect to the peak level of a

signal, which reads on the input and compression circuit (col. 4, lines 13-58, and col. 10, lines 5-

16, and figure 3). Wilson's disclosure indicates that a new gain can be calculated and provided to

the gains adjuster for controlling the gain of the signal, and as well providing gain changes in the

respect when sound level is above or below and certain predetermined level (col. 7 lines 3-53

accordingly, which teaches non-uniformed gain distribution by Wilson's gain calculators (figure

3, references 20 and 18); wherein, the gain gradient calculator calculates the rate adjustment of

the gains and is provided as a control signal to the gain adjuster, which justifies a type multiplier.

However, Wilson fails to disclose the calculator as a CSD multiplier.

Regarding the CSD multiplier, in a similar field of endeavor, Hausman et al. (herein,

Hausman) discloses a programmable CSD filter chip comprising a gain circuit (22) that includes

a CSD multiplier (44) - (col. 3, lines 19-42), which indicates a gain comprising a CSD multiplier.

It would have been obvious to one of the ordinary skill in the art at the time the invention

was made to modify the invention of Wilson by implementing CSD multiplier for the purpose of

enabling efficient gain control with a flexible configuration in respect to size and enabling

arbitrary gain control for desired precision with a small number of shifts, negation and additions

as taught by Hausman, which constitutes for an increase in the speed of the gain control

operation; wherein the use of CDS multipliers in gain controlling is a well technique as taught

by Lee (col. 1, lines 7-41).

Regarding **claims 6 and 27**, respectively, Wilson, Hausman and Lee (herein, Wilson

combination) disclose everything claimed as applied above (see claim 3 and 25, respectively).

Wilson combination obviously discloses the CSD multiplier adjusting the gain in real time as

evident of the enhanced and speedy processing capability of the CSD multiplier as taught by

Hausman and Lee.

Regarding claim 26, Wilson combination discloses everything claimed as applied above

(see claim 25). The Wilson combination thus obviously supports the gain being applied after the

evaluation of the compression ratio as evident by the gain calculated in respect to the

compression.

Regarding **claim 4**, Wilson discloses a method and system for compressing the dynamic

range of audio signals (figures 3 and 5). Wilson's disclosure comprises a receiver receiving an

audio input, wherein the audio input undergoes compression for the purposes of controlling level

of the signal from clipping a signal when the signal exceeds a particular level, specifically in

figure 3, a circuit is provided where an input is received, compression laws are applied to

calculate a gain value (inherent as a compression ratio) in respect to the peak level of a signal,

which reads on the input and compression circuit (col. 4, lines 13-58, and col. 10, lines 5-16, and

figure 3). Wilson's disclosure indicates that a new gain can be calculated and provided to the

gains adjuster for controlling the gain of the signal, and as well providing gain changes in the

respect when sound level is above or below and certain predetermined level (col. 7 lines 3-53

accordingly, which teaches non-uniformed gain distribution by Wilson's gain calculators (figure

3, references 20 and 18); wherein, the gain gradient calculator calculates the rate adjustment of

the gains and is provided as a control signal to the gain adjuster, which justifies a type multiplier.

However, Wilson fails to disclose the calculator as a CSD multiplier.

Regarding the CSD multiplier, in a similar field of endeavor, Hausman discloses a

programmable CSD filter chip comprising a gain circuit (22) that includes a CSD multiplier (44)

- (col. 3, lines 19-42), which indicates a gain comprising a CSD multiplier.

It would have been obvious to one of the ordinary skill in the art at the time the invention

was made to modify the invention of Wilson by implementing CSD multiplier for the purpose of

enabling efficient gain control with a flexible configuration in respect to size and enabling

arbitrary gain control for desired precision with a small number of shifts, negation and additions

as taught by Hausman, which constitutes for an increase in the speed of the gain control

operation; wherein the use of CDS multipliers in gain controlling is a well technique as taught

by Lee (col. 1, lines 7-41).

Eventhough, Wilson of the Wilson combination indicates that some of the parameters can

be altered those of ordinary skill in the art. Further, the Wilson Combination fail to disclose the

maximum gain step of the gain between .25 and .5db. Thus, it would have been obvious to one

of the ordinary skill in the art at the time the invention was made to modify the invention of

Wilson combination by providing a specific gain value for the purpose of optimizing the gain

control performance as desired.

Regarding **claims 7 and 28**, Wilson discloses a method and system for compressing the

dynamic range of audio signals (figures 3 and 5). Wilson's disclosure comprises a receiver

receiving an audio input, wherein the audio input undergoes compression for the purposes of

controlling level of the signal from clipping a signal when the signal exceeds a particular level,

specifically in figure 3, a circuit is provided where an input is received, compression laws are

applied to calculate a gain value (inherent as a compression ratio) in respect to the peak level of a

signal, which reads on the input and compression circuit (col. 4, lines 13-58, and col. 10, lines 5-

16, and figure 3). Wilson's disclosure indicates that a new gain can be calculated and provided to

the gains adjuster for controlling the gain of the signal, and as well providing gain changes in the

respect when sound level is above or below and certain predetermined level (col. 7 lines 3-53 accordingly, which teaches non-uniformed gain distribution by Wilson's gain calculators (figure 3, references 20 and 18); wherein, the gain gradient calculator calculates the rate adjustment of the gains and is provided as a control signal to the gain adjuster, which justifies a type multiplier. However, Wilson fails to disclose the calculator as a CSD multiplier.

Regarding the CSD multiplier, in a similar field of endeavor, Hausman discloses a programmable CSD filter chip comprising a gain circuit (22) that includes a CSD multiplier (44) - (col. 3, lines 19-42), which indicates a gain comprising a CSD multiplier.

It would have been obvious to one of the ordinary skill in the art at the time the invention was made to modify the invention of Wilson by implementing CSD multiplier for the purpose of enabling efficient gain control with a flexible configuration in respect to size and enabling arbitrary gain control for desired precision with a small number of shifts, negation and additions as taught by Hausman, which constitutes for an increase in the speed of the gain control operation; wherein the use of CDS multipliers in gain controlling is a well technique as taught by Lee (col. 1, lines 7-41).

Wilson combination (Hausman) does disclose a register (25) for the CSD multiplier for storing information indicative of the gain valuees, which indicates a second table. However, the Wilson combination fails to disclose a look-table storing discrete sound pressure level (values). The examiner takes official notice sound pressure level tables (volume registers or memories) were well known in the art. Thus, it would have been obvious to one of the ordinary skill in the art at the time the invention was made to modify the invention of Wilson combination by implementing a form of memory such a look-up table with sound pressure levels for the purpose

being able to control the volume or level of the input signal as well to enable dynamic sound

control.

Regarding claims 10 and 31, Wilson combination discloses everything claimed as applied

above (see claim 7 and 28, respectively). Wilson combination (Hausman) obviously includes in

the compensation register (25) CSD codes as evident by the fact that the CSD multiplier is

programmable and coding is the primary characteristic of a CSD multiplier.

3.   **Claim 15** are rejected under 35 U.S.C. 103(a) as being unpatentable over Smart et al., U.

S. Patent No. 5892834 in view of Dallavalle et al., U. S. Patent No. 5606625.

Regarding **claim 15**, Smart et al., (herein, Smart) discloses audio level dynamic range

compression (figure 1). Smart's disclosure comprises a compression circuit (1) with an audio

signal input into an audio processor including the amplifier (VCA), the compression circuit

comprises a compression ratio (figure 2), wherein a compression ratio is applied to the input

(digital value) signal when it is above the predetermined level (abstract), which reads on an input

and compression circui. However, Smart fails to specifically disclose, the compression circuit

having a state machine with a 1st and 2nd comparator and 1st and 2nd register, therein.

Regarding the compression having a state machine, in a similar field of endeavor,

Dallavalle et al. (herein, Dallasvalle) discloses a digitial circuit to regulate the gain of an

amplifier stage. Dallavalle's digital circuit reads on the state machine based upon its functions

and components, wherein the components included a digital comparator (5) which compares the

input signal to data provided thereto from the register (15), which indicates a 1st comparator and

1st register, digital comparator (6), which compares the input signal to data stored and provided

thereto by the resister (11) and the threshold register (12) – figure 1, abstract, col. 2, lines 48 –

col. 3, lines 28).

It would have been obvious to one of the ordinary skill in the art at the time the invention

was made to modify the invention of Smart by implementing a digital circuit for effectively

controlling the gain of analog signal after digitization to prevent distortion.

4.   **Claims 8-9, 12-14, 18-22, and 29-30, 32-33** are objected to as being dependent upon a

rejected base claim, but would be allowable if rewritten in independent form including all of the

limitations of the base claim and any intervening claims and if the claims are rewritten to

overcome the claim objection provided above.

5.   Claims 16-17 are allowed.

Response to Arguments

6.   Applicant's arguments with respect to claims 3 and 25 specifically have been considered

but are moot in view of the new ground(s) of rejection.

The applicant essentially argues that the prior art rejection of Wilson in combination of

Rainer, Lee and Werrbach fail to specifically disclosed the CSD multiplier providing gain

control, wherein, "Rainer does not disclose an ADC". In respect the latter, the applicant fails to

clearly explain the comment about the ADC, and thus, an ADC is not claimed in the invention.

However, a new reference of prior art,

Huasman has been used to modify the Wilson art rejection in respect to teaching the use of a

CSD multiplier in a gain calculation circuit for a digital component.

Conclusion

Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Laura A Grier whose telephone number is (703) 306-4819. The

examiner can normally be reached on Monday - Friday, 7:30 am - 4:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Sinh N Tran can be reached on (703) 305-4040. The fax phone number for the

organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent

Application Information Retrieval (PAIR) system. Status information for published applications

may be obtained from either Private PAIR or Public PAIR. Status information for unpublished

applications is available through Private PAIR only. For more information about the PAIR

system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR

system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Laura A. Grier
February 21, 2005